Jini Activity in Grid Forum

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Fifth Jini Community Meeting

Amsterdam, Holland

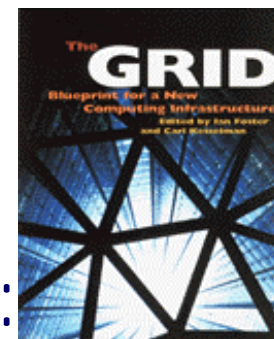11 December 2000

Grid Forum

The Global Grid Forum

- Grid Forum formed by individuals interested in high-capability distributed software systems or "Grids"
  - International community of researchers and practitioners
    - Participants from industry, universities and national labs
    - US, Europe, and Pacific Rim countries represented
  - Scope of research applications quite broad
    - Distributed collaborative environments, distributed data analysis, remote instrument control, …
- Grid applications can involve hundreds or thousands of components
  - "peer-to-peer" or client-server fashion arrangements
    - peer-to-peer model is likely to dominate

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Grids

- Emerging applications coordinate multiple geographically distributed resources
  - high performance computing
  - information analysis
  - distributed collaboration
- Grids: Provide functions to support such applications
  - enables development, deployment and operational support
- Grid infrastructure services
  - Caching
  - Authentication
  - Resource discovery
  - Resource scheduling
  - Security

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Two initial ideas: One by Foster and Kesselman

Large-scale applications in the 21st Century:

- will involve
  - the communication with and the coordination of a large number of geographically dispersed information sources

- will require an environment that supports
  - Reliable
  - Fault-tolerant
  - Highly distributed
  - Heterogeneous
  - Scalable

  computing infrastructure

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Two: Electrical Grid

Electric power applications have caused radical changes in the individual and collective life of people.

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Hence, the NASA Power Grid

- Make use of computing power, without owning computational resources

- Based on the model of the "electrical power grid" (National Grid)

- We use electricity, but do not OWN power generating stations -- key themes are "distribution" and "transmission"

- Hence, aim to build something similar, but for "Computation / information"

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Jini Activity in Grid Forum

- A subgroup within the Grid Forum Information Services Group to evaluate:
  - use of Jini as infrastructure technology for Grid environments and applications
  - proposed at October meeting
- Process:
  - interest community
  - develop white papers analysing the benefits and disadvantages for a Grid Environment
  - implementation of prototypes
  - provide resources, seminars and tutorials on Jini
  - Next meeting at GridForum6 (Amsterdam) in March

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Two kinds of participants

- *How can Jini be integrated effectively with Grid infrastructure, to support the discovery and management of Information Services?*

- *How can Jini be extended and enhanced to make it more suitable for Grid applications (if need be)?*

Application/Use

Infrastructure

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Involvement

- Community involvement is required to take this proposal further

- Grid Forum details at:
  - http://www.gridforum.org/
  - http://www.gridcomputing.com/

- Web site of this activity at:
  - http://www.cs.cf.ac.uk/User/O.F.Rana/jini/

- Send subscribe request to:

  jini-activity@gridforum.org

(Must subscribe to participate - to avoid spam mail)

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- How can the Grid infrastructure benefit from Jini?
- Can Jini be used effectively with existing Grid infrastructure?
- How can the Jini Lookup service be utilised with Grid tools?
- What extensions (if any) are necessary to make Jini work with the Grid, and the Grid with Jini?
- How many services can be registered and managed through Jini?
- Is there a performance cost in using Jini? - if yes, where does this performance cost occur?
- How do we create a federation of LUSs?
- What is the best way to design and implement hierarchical Jini systems?
- What are the possible systems architectures for integrating Jini with Grid tools and services?
- What should be the architecture for the LUS within a Grid environment?
- How can the Grid Security Interface be incorporated within Jini? Also can JAAS and token based security be incorporated in Grid infrastructure?
- What should be the time interval for leasing in Jini? What impact does the granularity of this time interval have?

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